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June 1965

**UNITED STATES DEPARTMENT OF AGRICULTURE
CONSUMER AND MARKETING SERVICE**

SERVICE AND REGULATORY ANNOUNCEMENTS C&MS 99¹

**OFFICIAL UNITED STATES STANDARDS FOR GRADES
OF CARCASS BEEF**

(Title 7, Ch. I, Pt. 53, Sections 53,102-53,106 of the Code of Federal Regulations)

The following is a reprint of the official United States standards for the grades of carcass beef promulgated by the Secretary of Agriculture under the Agricultural Marketing Act of 1946 (60 Stat. 1087; 7 U.S.C. 1621 et seq.) as amended and related authority in the annual appropriation acts for the Department of Agriculture. The standards are reprinted with amendments effective June 1, 1965.

DEVELOPMENT OF THE STANDARDS

The tentative U.S. standards for the Grades of Dressed Beef were formulated in 1916. They provided the basis for uniformly reporting the dressed beef markets according to grades, which work was inaugurated as a national service early in 1917. The grade specifications were improved from time to time as experience gained through their use indicated what changes were necessary. They were published first in mimeographed form in June 1923. After slight changes they were included in the Department Bulletin No. 1246 "Market Classes and Grades of Dressed Beef" which was published in August 1924.

Public hearings were held at Portland, Oreg., Chicago, Ill., and New York, N.Y., in 1925 to give producers, slaughterers, wholesale and retail meat dealers, agricultural college workers, and others interested in the marketing of livestock and meat an opportunity to make suggestions for improving the standards. The sentiment registered at those meetings was overwhelmingly in favor of the grades as presented. The few suggestions and criticisms offered were carefully considered in subsequent revisions of the standards.

The tentative standards, although designed primarily for meat market reporting purposes, were put to further practical test in numerous ways. During World War I they were used in the selection of beef for the Army, Navy, and Allies. Later they were included in the specifications of the Emergency Fleet Corporation for the purchase of its beef supplies. Soon thereafter they were incorporated in the specifications of many commercial concerns, including steamship lines, restaurants, hotels, dining-car services, and hospitals.

The revised grade descriptions were promulgated by the Secretary of Agriculture, June 3, 1926, as the Official United States

¹ This announcement was issued originally as Service and Regulatory Announcements No. 99 of the Bureau of Agricultural Economics.

Standards for the Grades of Carcass Beef and published in Service and Regulatory Announcements No. 99 (B.A.E.). These standards provided the basis for grading when the voluntary beef grading and stamping service was begun in May 1927.

The official standards were amended in July 1939 to provide a single standard for the grading and labeling of steer, heifer, and cow beef according to similar inherent quality characteristics. The amendment also changed certain grade terms for steer, heifer, and cow beef from "Medium," "Common," and "Low Cutter" to "Commercial," "Utility," and "Canner," respectively. An amendment in November 1941 made similar changes in the grade terms for bull and stag beef and established the following grade terminology for all beef: Prime,² Choice, Good, Commercial, Utility, Cutter, and Canner. An amendment in October 1949 eliminated all references to color of fat.

In December 1950, the official standards for grades of steer, heifer, and cow beef were amended by combining the Prime and Choice grades and designating them as Prime, renaming the Good grade as Choice, and dividing the Commercial grade into two grades by designating the beef produced from young animals included in the top half of the grade as Good while retaining the Commercial grade designation for the remainder of the beef in that grade. Other revisions in the standards for the Prime, Choice, Good, and Commercial grades were made to clarify them and to facilitate their interpretation. Standards for the Utility, Cutter, and Canner grades were not affected. These changes in the standards were a modification of a proposal by the Department to revise the standards in August 1949, and were adopted after careful consideration of comments received in writing over a period of months and those presented orally at a public hearing at Chicago, on June 28, 1950.

In June 1956, the official standards for grades of steer, heifer, and cow beef were amended by dividing the Commercial grade into two grades strictly on the basis of maturity with beef produced from young animals being designated as Standard while Commercial was retained as the grade name for beef produced from mature animals. This change, which was suggested by the Cattle and Beef Industry Committee, was identical in principle to that proposed by the Department in August 1949.

The official standards for grades of steer, heifer, and cow beef were revised in June 1965 to place less emphasis on changes in maturity in the Prime, Choice, Good, and Standard grades. This change was made to reflect the latest research information available regarding the effect of maturity on beef palatability. The minimum marbling permitted in these grades was not changed for the very youngest beef. However, the rate of increase in required marbling to offset increasing maturity was changed, and the minimum marbling permitted was reduced for more mature carcasses by as much as 1 1/2 degrees in Prime, 1 degree in Choice, and 3/4 of a degree in Good and Standard. In addition, the revision eliminated consideration of the two degrees of marbling in excess of that

² The use of the grade specified as "Prime" for beef carcasses and wholesale cuts was suspended for the period September 18, 1942, to December 3, 1946, pursuant to amendment 5, Maximum Price Regulation 169 of the Office of Price Administration. During that period all carcass beef and wholesale cuts that met the specifications of the "Prime" grade were identified with and graded as "Choice."

described as abundant. The manner of evaluating conformation also was clarified by providing that carcasses may meet the conformation requirements for a grade either through a specified development of muscling or a specified development of muscling and fat combined. This revision also included a requirement that all carcasses be ribbed prior to grading and made other minor changes to clarify the intent of the standards and simplify their application. An added provision established standards for cutability grades of carcasses and certain wholesale cuts of all classes of beef. A dual grading system for beef carcasses, involving separate identification of differences in quality and in cutability, had been proposed by the Department in April 1962 and made available for use on a trial basis for a one-year period beginning July 1, 1962. The cutability standards adopted in 1965 were similar to those included as a part of the dual grading system, but modified on the basis of comments from industry and experience gained during the trial period of the dual grading system.

APPLICATION OF STANDARDS FOR GRADES OF CARCASS BEEF

The grade of a beef carcass is based on separate evaluations of two general considerations: (1) Palatability-indicating characteristics of the lean and conformation, herein referred to as "quality" and (2) the indicated percent of trimmed, boneless, major retail cuts to be derived from the carcass, herein referred to as "cutability." However, the grade of a beef carcass when applied by Federal meat graders may consist of an evaluation for the quality designation, the cutability designation, or a combination of both the quality and cutability designations. In previous grade standards for beef and in the standards for grades of other kinds of meat, the Department uses the term "quality" to refer only to the palatability-indicating characteristics of the lean without reference to conformation. Its use herein to include consideration of conformation is not intended to imply that variations in conformation are either directly or indirectly related to differences in palatability.

The grade standards are written so that the quality and cutability standards are contained in separate sections. The quality section is divided further into three separate sections applicable to carcasses from (1) steers, heifers, and cows, (2) bulls, and (3) stags. There are five cutability groups applicable to all classes of beef, denoted by numbers 1 through 5, with cutability group 1 representing the highest degree of cutability. Eight quality designations--Prime, Choice, Good, Standard, Commercial, Utility, Cutter, and Canner--are applicable to steer, heifer and cow carcasses, except that cow carcasses are not eligible for Prime. The quality designations for bull and stag beef are Choice, Good, Commercial, Utility, Cutter, and Canner.

The standards provide for the grading and stamping of beef from steers, heifers, and cows according to its characteristics as beef without sex identification. Such beef placed within each respective grade, therefore, shall possess the characteristics specified for that grade, irrespective of the sex of the animal from which it was derived. Beef produced from bulls and stags shall be graded according to its characteristics as bull beef or as stag beef in accordance with the standards. When graded and identified according to grade, such beef shall be identified also for class as "Bull"

beef or "Stag" beef, as the case may be. The designated grades of bull beef or stag beef herein are not necessarily comparable in quality or cutability with a similarly designated grade of beef derived from steers, heifers, or cows. Neither is the quality or cutability in a designated grade of bull beef necessarily comparable with a similarly designated grade of stag beef.

The Department uses photographs and other objective aids in the correct interpretation and application of the standards.

To determine the quality or cutability of a carcass, it must be split down the back into two sides and one side must be partially separated into a hindquarter and forequarter by sawing and cutting it, insofar as practicable, as follows: A saw cut perpendicular to both the long axis and split surface of the vertebral column is made across the 12th thoracic vertebra at a point which leaves not more than one-half of this vertebra on the hindquarter. The knife cut across the ribeye muscle starts--or terminates--opposite the above-described saw cut. From that point it extends across the ribeye muscle perpendicular to the outside skin surface of the carcass at an angle toward the hindquarter which is slightly greater (more nearly horizontal) than the angle made by the 13th rib with the vertebral column of the hindquarter posterior to that point. As a result of this cut, the outer end of the cut surface of the ribeye muscle is closer to the 12th rib than is the end next to the chine bone. Beyond the ribeye, the knife cut shall continue between the 12th and 13th ribs to a point which will adequately expose the distribution of fat and lean in this area. The knife cut may be made prior to or following the saw cut but must be smooth and even, such as would result from a single stroke of a very sharp knife.

Other methods of ribbing may prevent an accurate evaluation of grade determining characteristics. Therefore, carcasses ribbed by other methods will be eligible for grading only if an accurate grade determination is possible.

Beveling of the fat over the ribeye, application of pressure, or any other influences which alter the area of the ribeye or the thickness of fat over the ribeye prevent an accurate cutability determination. Therefore, carcasses subjected to such influences may not be eligible for a cutability determination. Also carcasses with more than minor amounts of lean removed from the major sections of the round, loin, rib, or chuck will not be eligible for a cutability determination.

The quality and cutability grade descriptions are defined primarily in terms of carcass beef. However, the quality standards also apply to the grading of hindquarters, forequarters, and individual primal cuts--rounds, loins, short loins, loin ends, ribs, and chucks. A portion of a primal cut as well as plates, flanks, shanks, and briskets likewise can be graded if attached by their natural attachments to a primal cut. Grade requirements for individual primal cuts or special cuts eligible for grading shall be based on the requirements specified in these standards and shall be consistent with the normal development of grade characteristics in various parts of a carcass of the quality level involved. The cutability standards also are applicable to the grading of hindquarters and forequarters, and to ribs, loins, short loins, and combinations of wholesale cuts which include either a rib or a short loin. Until such time as cutability standards are developed for rounds and chucks, their grade--when graded as a wholesale cut--will consist of the quality grade only. Other special major

cuts or carcasses ribbed other than between the 12th and 13th ribs may be approved by the Consumer and Marketing Service for grading provided such deviations are necessary to meet either the demand of export trade or changing trade practices.

Carcasses or wholesale cuts qualifying for any particular quality or cutability grade may vary with respect to their relative development of the various grade factors. There will be carcasses or wholesale cuts which qualify for a particular grade, some of whose characteristics may be more nearly typical of another grade. The following is an illustration of the foregoing. In comparison with the descriptions of maturity contained in the standards, a particular carcass might have a greater relative degree of ossification of the cartilages on the ends of its lumbar vertebrae than its other evidences of maturity. In such instances, the maturity of the carcass is not determined solely by the ossification of the lumbar vertebrae but neither is this ignored. All of the maturity-indicating factors are considered. In making any composite evaluation of two or more factors, it must be remembered that these frequently are developed to a different relative extent. Because it is impractical to describe the nearly limitless number of such recognizable combinations of characteristics, the standards for each quality and cutability grade describe only beef which has a relatively similar degree of development of the various factors affecting its quality and cutability. Also, the quality and cutability standards each describe beef which is representative of the lower limits of each quality and cutability group.

The quality grade of a beef carcass is based on separate evaluations of two general considerations: (1) The quality or the palatability-indicating characteristics of the lean and (2) the conformation of the carcass.

Conformation is the manner of formation of the carcass or primal cut. The conformation descriptions included in each of the grade specifications refer to the thickness of muscling and to an overall degree of thickness and fullness of the carcass and its various parts. Carcasses or primal cuts which meet the requirements for thickness of muscling specified for a grade will be considered to have conformation adequate for that grade despite the fact that, because of a lack of fatness, they may not have the overall degree of thickness and fullness described.

Conformation is evaluated by averaging the conformation of the various parts of the carcass or primal cut, considering not only the proportion that each part is of the carcass or primal cut weight but also the general value of each part as compared with the other parts. Thus, although the chuck and round are nearly the same percentage of the carcass weight, the round is considered the more valuable cut. Therefore, in evaluating the overall conformation of a carcass, the development of the round is given more consideration than the development of the chuck. Similarly, since the loin is both a greater percentage of the carcass weight and also generally a more valuable cut than the rib, its conformation receives much more consideration than the conformation of the rib. Superior conformation implies a high proportion of meat to bone and a high proportion of the weight of the carcass or cut in the more valuable parts. It is reflected in carcasses and cuts which are very thickly muscled, very full and thick in relation to their length and which have a very plump, full, and well-rounded appearance. Inferior conformation implies a low proportion of meat to bone and a low

proportion of the weight of the carcass or cut in the more valuable parts. It is reflected in carcasses and cuts which are very thinly muscled, very narrow and thin in relation to their length and which have a very angular, thin, sunken appearance.

Quality of the lean is evaluated by considering its marbling and firmness as observed in a cut surface in relation to the apparent maturity of the animal from which the carcass was produced. The maturity of the carcass is determined by evaluating the size, shape, and ossification of the bones and cartilages--especially the split chine bones--and the color and texture of the lean flesh. In the split chine bones, ossification changes occur at an earlier stage of maturity in the posterior portion of the vertebral column (sacral vertebrae) and at progressively later stages of maturity in the lumbar and thoracic vertebrae. The ossification changes that occur in the cartilages on the ends of the split thoracic vertebrae are especially useful in evaluating maturity and these vertebrae are referred to frequently in the standards. Unless otherwise specified in the standards, whenever the ossification of cartilages on the thoracic vertebrae is referred to, this shall be construed to refer to the cartilages attached to the thoracic vertebrae at the posterior end of the forequarter. The size and shape of the rib bones also are important considerations in evaluating differences in maturity. In the very youngest carcasses considered as "beef," the cartilages on the ends of the chine bones show no ossification, cartilage is evident on all the vertebrae of the spinal column, and the sacral vertebrae show distinct separation. In addition, the split vertebrae usually are soft and porous and very red in color. In such carcasses the rib bones have only a slight tendency toward flatness. In progressively more mature carcasses, ossification changes become evident first in the bones and cartilages of the sacral vertebrae, then in the lumbar vertebrae, and still later in the thoracic vertebrae. In beef which is very advanced in maturity, all the split vertebrae will be devoid of red color, very hard and flinty, and the cartilages on the ends of all the vertebrae will be entirely ossified. Likewise, with advancing maturity, the rib bones will become progressively wider and flatter until in beef from very mature animals the ribs will be very wide and flat.

The color and texture of the lean flesh also undergo progressive changes with advancing maturity. In the very youngest carcasses considered as "beef," the lean flesh will be very fine in texture and light grayish red in color. In progressively more mature carcasses, the texture of the lean will become progressively coarser and the color of the lean will become progressively darker red. In very mature beef the lean flesh will be very coarse in texture and very dark red in color. Since color of lean also is affected by variations in quality, references to color of lean in the standards for a given degree of maturity vary slightly with different levels of quality. In determining the maturity of a carcass or cut in which the skeletal evidences of maturity are different from those indicated by the color and texture of the lean, slightly more emphasis is placed on the characteristics of the bones and cartilages than on the characteristics of the lean. In no case can the overall maturity of the carcass or cut be considered more than one full maturity group different from that indicated by its bones and cartilages.

In determining compliance with the maximum maturity limits for the Prime, Choice, Good, and Standard grades, color and texture

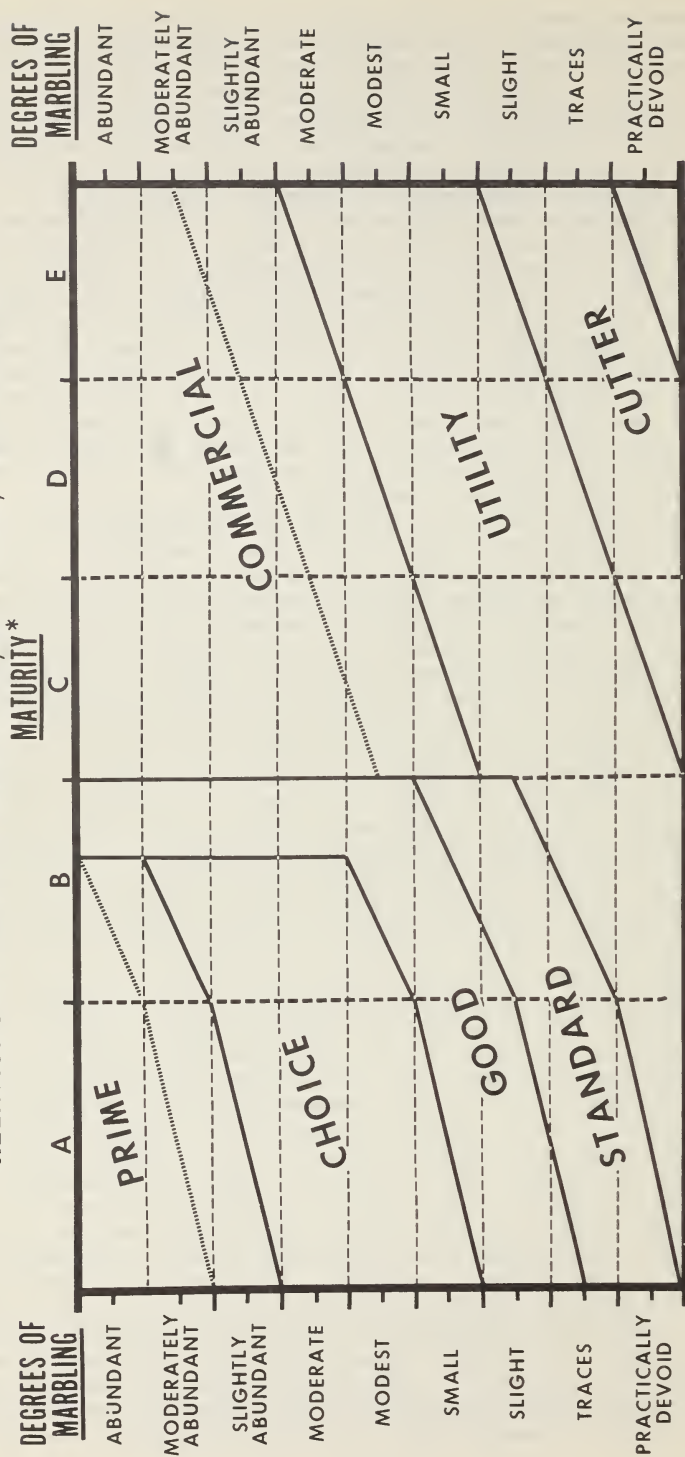
of the lean are considered only when the maturity-indicating factors other than color and texture of the lean indicates only a slightly more advanced degree of maturity than that specified as maximum for the applicable grade, and provided further that the lean is considerably finer in texture and lighter in color than normal for the grade and maturity involved. The same principle, in reverse, is likewise applicable to determining compliance with the minimum maturity limits of the Commercial grade.

These standards are applicable to the grading of beef within the full range of maturity within which cattle are marketed. However, the range of maturity permitted within each of the grades varies considerably. The Prime, Choice, Good, and Standard grades are restricted to beef from young cattle; the Commercial grade is restricted to beef from cattle too mature for Good or Standard; and the Utility, Cutter, and Canner grades include beef from animals of all ages. Within any specified grade, the requirements for marbling and firmness increase progressively with evidences of advancing maturity. To facilitate the application of this principle, the standards recognize nine different degrees of marbling and five different maturity groupings.

The relationship between marbling, maturity, and quality (that part of the final grade that represents the palatability of the lean) is shown in Figure 1. From this figure it can be seen, for instance, that the minimum marbling requirement for Choice varies from a minimum small amount for the very youngest carcasses classified as beef to a maximum modest amount for carcasses having the maximum maturity permitted in Choice. Likewise, in the Commercial grade the minimum marbling requirement varies from a minimum small amount in beef from animals with the minimum maturity permitted to a maximum moderate amount in beef from very mature animals. Illustrations of the lower limits of eight of the nine degrees of marbling considered in grading beef are available from the Department of Agriculture. No consideration is given to marbling beyond that considered "maximum abundant." The marbling and other lean flesh characteristics specified for the various grades are based on their appearance in the ribeye muscle of properly chilled carcasses that are ribbed between the 12th and 13th ribs.

The final quality grade of a carcass or primal cut is based on a composite evaluation of its conformation and quality. Since relatively few carcasses or cuts have an identical development of conformation and quality, it is obvious that each grade will include various combinations of development of these two characteristics. Examples of how conformation and quality are combined into the final quality grade are included in each of the grade descriptions. The principles governing these compensations are as follows: In each of the grades a superior development of quality is permitted to compensate for a deficient development of conformation, without limit, through the upper limit of quality. The rate of compensation in all grades is on an equal basis--a given degree of superior quality compensates for the same degree of deficient conformation. The reverse type of compensation--a superior development of conformation for an inferior development of quality--is not permitted in the Prime, Choice, and Commercial grades. In all other grades this type of compensation is permitted but only to the extent of one-third of a grade of deficient quality. The rate of compensation is also on an

RELATIONSHIP BETWEEN MARBLING, MATURITY, AND QUALITY



* Maturity increases from left to right (A through E)
 Represents midpoint of Prime and Commercial grades.

Figure 1

equal basis--a given degree of superior conformation compensates for the same degree of deficient quality.

References to color of lean in the standards involve only colors associated with changes in maturity. They are not intended to apply to colors of lean associated with so-called "dark cutting beef". Dark cutting beef is believed to be the result of a reduced sugar content of the lean at the time of slaughter. As a result, this condition does not have the same significance in grading as do the darker shades of red associated with advancing maturity. The dark color of the lean associated with "dark cutting beef" is present in varying degrees from that which is barely evident to so-called "black cutters" in which the lean is actually nearly black in color and usually has a "gummy" texture. Although there is little or no evidence which indicates that the "dark cutting" condition has any adverse effect on palatability, it is considered in grading because of its effect on acceptability and value. Dependent upon the degree to which this characteristic is developed, the final grade of carcasses which otherwise would qualify for the Prime, Choice, or Good grades may be reduced as much as one full grade. In beef otherwise eligible for the Standard or Commercial grade, the final grade may be reduced as much as one-half of a grade. In the Utility, Cutter, and Canner grades, this condition is not considered.

The cutability group of a beef carcass is determined by considering four characteristics: (1) The amount of external fat, (2) the amount of kidney, pelvic, and heart fat, (3) the area of the ribeye, muscle, and (4) the carcass weight.

The amount of external fat on a carcass is evaluated in terms of the thickness of this fat over the ribeye muscle measured perpendicular to the outside surface at a point three-fourths of the length of the ribeye from its chine bone end. This measurement may be adjusted, as necessary, to reflect unusual amounts of fat on other parts of the carcass. In determining the amount of this adjustment, if any, particular attention is given to the amount of fat in such areas as the brisket, plate, flank, cod or udder, inside round, rump, and hips in relation to the actual thickness of fat over the ribeye. Thus, in a carcass which is fatter over other areas than is indicated by the fat measurement over the ribeye, the measurement is adjusted upward. Conversely, in a carcass which has less fat over the other areas than is indicated by the fat measurement over the ribeye, the measurement is adjusted downward. In many carcasses no such adjustment is necessary; however, an adjustment in the thickness of fat measurement of one-tenth or two-tenths of an inch is not uncommon. In some carcasses a greater adjustment may be necessary. As the amount of external fat increases, the percent of retail cuts decreases--each one-tenth inch change in adjusted fat thickness over the ribeye changes the cutability group by 25 percent of a cutability group.

The amount of kidney, pelvic, and heart fat considered in determining the cutability group includes the kidney knob (kidney and surrounding fat), the lumbar and pelvic fat in the loin and round, and the heart fat in the chuck and brisket area which are removed in making closely trimmed retail cuts. The amount of these fats is evaluated subjectively and expressed as a percent of the carcass weight. As the amount of kidney, pelvic, and heart fat increases, the percent of retail cuts decreases--a change of 1

percent of the carcass weight in these fats changes the cutability group by 20 percent of a cutability group.

The area of the ribeye is determined where this muscle is exposed by ribbing. This area usually is estimated subjectively; however, it may be measured. Area of ribeye measurements may be made by means of a grid calibrated in tenths of a square inch or by other devices designated by C&MS. An increase in the area of ribeye increases the percent of retail cuts--a change of 1 square inch in area or ribeye changes the cutability group by approximately 30 percent of a cutability group.

Hot carcass weight (or chilled carcass weight x 102 percent) is used in determining the cutability group. As carcass weight increases, the percent of retail cuts decreases--a change of 100 pounds in hot carcass weight changes the cutability group by approximately 40 percent of a cutability group.

The standards include a mathematical equation for determining cutability group. This group is expressed as a whole number; any fractional part of a designation is always dropped. For example, if the computation results in a designation of 3.9, the final cutability group is 3--it is not rounded to 4.

The cutability standards for each of the first four cutability groups list characteristics of two carcasses of two different weights together with descriptions of the usual fat deposition pattern on various areas of the carcass. These descriptions are not specific requirements--they are included only as illustrations of carcasses which are near the borderlines between groups. For example, the characteristics listed for cutability group 1 represent carcasses which are near the borderline of cutability groups 1 and 2. These descriptions facilitate the subjective determination of the cutability group without making detailed measurements and computations. The cutability group for most beef carcasses can be determined accurately on the basis of a visual appraisal.

SPECIFICATIONS FOR OFFICIAL UNITED STATES STANDARDS FOR GRADES OF CARCASS BEEF (CUTABILITY)

The cutability group of a beef carcass is determined on the basis of the following equation: Cutability group-- $2.50 + (2.50 \times \text{adjusted fat thickness, inches}) + (0.20 \times \text{percent kidney, pelvic, and heart fat}) + (0.0038 \times \text{hot carcass weight, pounds}) - (0.32 \times \text{area ribeye, square inches})$.

The cutability group of a hindquarter, forequarter, or cut eligible for grading also is determined on the basis of the above equation in which the hot carcass weight is determined by multiplying the chilled weight of the cut by an appropriate factor as applicable to the cut and its style of preparation.

The factors shown below shall be applicable to hindquarters and forequarters produced by ribbing as described herein, and to ribs, trimmed full loins, and trimmed short loins which are trimmed as described in Items 103, 172, and 173, respectively, of the Institutional Meat Purchase (IMP) Specifications for Fresh Beef--Series 100, as revised October 1961.

	<u>Factor</u>
Forequarter	3.90
Hindquarter	4.25
Rib	22.50
Loin, full, trimmed	12.75
Short Loin, trimmed	29.10

A slightly larger factor, appropriate to reflect the weight of the cut as a percent of hot carcass weight, shall be used for ribs, full loins, or short loins which are more closely trimmed than described in the referenced IMP Specifications. Similarly, a smaller factor shall be used for determining the cutability group of these cuts when trimmed less closely than specified or when they include portions or all of adjacent cuts.

In addition, for forequarters and forequarter cuts and for trimmed hindquarters and trimmed hindquarter cuts, the following standard percentages of kidney, pelvic, and heart fat, as applicable to the quality grade of the quarter or cut, also shall be used in the equation:

Grade:	Kidney, pelvic, and heart fat percent
Prime.....	4.5
Choice.....	3.5
Good.....	3.0
Standard.....	2.0
Commercial.....	4.0
Utility.....	2.0
Cutter and Canner.....	1.5

For untrimmed hindquarters and for untrimmed hindquarter cuts, the quantity of a kidney and pelvic fat is estimated as a percent of the hot side weight.

The following descriptions provide a guide to the characteristics of carcasses in each cutability group to aid in determining cutability groups subjectively.

CUTABILITY GROUP 1

A carcass in cutability group 1 usually has only a thin layer of external fat over the ribs, loins, rumps, and clods and slight deposits of fat in the flanks and cod or udder. There is usually a very thin layer of fat over the outside of the rounds and over the tops of the shoulders and necks. Muscles are usually visible through the fat in many areas of the carcass.

A 500-pound carcass of this group which is near the borderline of cutability groups 1 and 2 might have three-tenths inch of fat over the ribeye, 11.5 square inches of ribeye, and 2.5 percent of its weight in kidney, pelvic, and heart fat.

An 800-pound carcass of this group which is near the borderline of cutability groups 1 and 2 might have four-tenths inch of fat over the ribeye, 16.0 square inches of ribeye, and 2.5 percent of its weight in kidney, pelvic, and heart fat.

CUTABILITY GROUP 2

A carcass in cutability group 2 usually is nearly completely covered with fat but the lean is plainly visible through the fat over the outside of the rounds, the tops of shoulders, and the necks. There usually is a slightly thin layer of fat over the loins, ribs, and inside rounds and the fat over the rumps, hips, and clods usually is slightly thick. There are usually small deposits of fat in the flanks and cod or udder.

A 500-pound carcass of this group which is near the borderline of cutability groups 2 and 3 might have five-tenths inch of fat over the ribeye, 10.5 square inches of ribeye, and 3.5 percent of its weight in kidney, pelvic, and heart fat.

An 800-pound carcass of this group which is near the borderline of cutability groups 2 and 3 might have six-tenths inch of fat over the ribeye, 15.0 square inches of ribeye, and 3.5 percent of its weight in kidney, pelvic, and heart fat.

CUTABILITY GROUP 3

A carcass in cutability group 3 usually is completely covered with fat and the lean usually is visible through the fat only on the necks and the lower part of the outside of the rounds. There usually is a slightly thick layer of fat over the loins, ribs, and inside rounds and the fat over the rumps, hips, and clods usually is moderately thick. There usually are slightly large deposits of fat in the flanks and cod or udder.

A 500-pound carcass of this group which is near the borderline of cutability groups 3 and 4 might have seven-tenths inch of fat over the ribeye, 9.5 square inches of ribeye, and 4.0 percent of its weight in kidney, pelvic, and heart fat.

An 800-pound carcass of this group which is near the borderline of cutability groups 3 and 4 might have eight-tenths inch of fat over the ribeye, 14.0 square inches of ribeye, and 4.5 percent of its weight in kidney, pelvic, and heart fat.

CUTABILITY GROUP 4

A carcass in cutability group 4 usually is completely covered with fat. The only muscles usually visible are those on the shanks and over the outside of the plates and flanks. There usually is a moderately thick layer of fat over the loins, ribs, and inside rounds and the fat over the rumps, hips, and clods usually is thick. There usually are large deposits of fat in the flanks and cod or udder.

A 500-pound carcass of this group which is near the borderline of cutability groups 4 and 5 might have one inch of fat over the ribeye, 9.0 square inches of ribeye, and 4.5 percent of its carcass weight in kidney, pelvic, and heart fat.

An 800-pound carcass of this group which is near the borderline of cutability groups 4 and 5 might have one and one-tenth inch of fat over the ribeye, 13.5 square inches of ribeye, and 5.0 percent of its weight in kidney, pelvic, and heart fat.

CUTABILITY GROUP 5

A carcass in cutability group 5 usually has more fat on all of the various parts, a smaller area of ribeye, and more kidney, pelvic, and heart fat than a carcass in cutability group 4.

SPECIFICATIONS FOR OFFICIAL UNITED STATES STANDARDS FOR GRADES OF CARCASS BEEF (QUALITY—STEER, HEIFER, COW).

PRIME

Carcasses and wholesale cuts with minimum Prime grade conformation are thickly muscled throughout and tend to be very

wide and thick in relation to their length. Loins and ribs tend to be thick and full. Rounds tend to be plump and the plumpness carries well down to the hocks. The chucks tend to be thick and the necks and shanks tend to be short.

Minimum quality characteristics are described for two maturity groups which cover the entire range of maturity permitted in the Prime grade.

Carcasses in the younger group range from the youngest that are eligible for the beef class to those at the juncture of the two maturity groups, which have slightly red and slightly soft chine bones and cartilages on the ends of the thoracic vertebrae that have some evidence of ossification. In addition, the sacral vertebrae are completely fused and the cartilages on the ends of the lumbar vertebrae are nearly completely ossified. The rib bones are slightly wide and slightly flat and the ribeye muscle is light red in color and is fine in texture. The minimum degree of marbling required increases with advancing maturity throughout this group from minimum slightly abundant to maximum slightly abundant (see Figure 1) and the ribeye muscle is moderately firm.

Carcasses in the older group range from those described above as representative of the juncture of the two groups to those at the maximum maturity permitted in the Prime grade, which have chine bones tinged with red and cartilages on the ends of the thoracic vertebrae that are partially ossified. In addition, the cut surface of the lean tends to be fine in texture and the carcasses are at least moderately symmetrical and uniform in contour. The minimum degree of marbling required increases with advancing maturity throughout this group from minimum moderately abundant to maximum moderately abundant (see Figure 1) and the ribeye muscle is firm.

A development of quality superior to that specified as minimum for the Prime grade may compensate, without limit, for a development of conformation inferior to that specified as minimum for Prime at an equal rate as indicated in the following example: A carcass which has mid-point Prime quality may have conformation equal to the mid-point of the Choice grade and remain eligible for Prime. However, regardless of the extent to which the conformation of a carcass exceeds the minimum of the grade, a carcass must have minimum Prime quality to be eligible for Prime.

Only beef produced from steers and heifers is eligible for the Prime grade.

CHOICE

Carcasses and wholesale cuts with minimum Choice grade conformation are moderately thick muscled throughout and tend to be moderately wide and thick in relation to their length. Loins and ribs tend to be moderately thick and full. Rounds tend to be moderately plump. The chucks tend to be moderately thick and the necks and shanks tend to be moderately short.

Minimum quality characteristics are described for two maturity groups which cover the entire range of maturity permitted in the Choice grade.

Carcasses in the younger group range from the youngest that are eligible for the beef class to those at the juncture of the two maturity groups, which have slightly red and slightly soft chine bones and cartilages on the ends of the thoracic vertebrae that

have some evidence of ossification. In addition, the sacral vertebrae are completely fused and the cartilages on the ends of the lumbar vertebrae are nearly completely ossified. The rib bones are slightly wide and slightly flat and the ribeye muscle is moderately light red in color and is fine in texture. The minimum degree of marbling required increases with advancing maturity throughout this group from a minimum small amount to a maximum small amount (see Figure 1) and the ribeye muscle is slightly soft.

Carcasses in the older group range from those described above as representative of the juncture of the two groups to those at the maximum maturity permitted in the Choice grade, which have chine bones tinged with red and cartilages on the ends of the thoracic vertebrae that are partially ossified. In addition, the cut surface of the lean tends to be fine in texture and the carcasses are at least moderately symmetrical and uniform in contour. The minimum degree of marbling required increases with advancing maturity throughout this group from a minimum modest amount to a maximum modest amount (see Figure 1) and the ribeye muscle is slightly firm.

A development of quality superior to that specified as minimum for the Choice grade may compensate, without limit, for a development of conformation inferior to that specified as minimum for Choice at an equal rate as indicated in the following example: A carcass which has mid-point Choice quality may have conformation equal to the mid-point of the Good grade and remain eligible for Choice. However, regardless of the extent to which the conformation of a carcass exceeds the minimum of the grade, a carcass must have minimum Choice quality to be eligible for Choice.

GOOD

Carcasses and wholesale cuts with minimum Good grade conformation are slightly thick muscled throughout and tend to be slightly wide and thick in relation to their length. Loins and ribs tend to be slightly thick and full. Rounds tend to be slightly plump, and necks and shanks tend to be slightly long and thin.

Minimum quality characteristics are described for two maturity groups which cover the entire range of maturity permitted in the Good grade.

Carcasses in the younger group range from the youngest that are eligible for the beef class to those at the juncture of the two maturity groups, which have slightly red and slightly soft chine bones and cartilages on the ends of the thoracic vertebrae that have some evidence of ossification. In addition, the sacral vertebrae are completely fused and the cartilages on the ends of the lumbar vertebrae are nearly completely ossified. The rib bones are slightly wide and slightly flat and the ribeye muscle is slightly light red in color and is fine in texture. The minimum degree of marbling required increases with advancing maturity throughout this group from typical traces to a typical slight amount (see Figure 1) and the ribeye muscle is moderately soft.

Carcasses in the older group range from those described above as representative of the juncture of the two groups to those at the maximum maturity permitted in the Good grade, which have chine bones tinged with red and cartilages on the ends of the thoracic vertebrae that are moderately ossified. In addition, the cut surface of the lean is moderately fine in texture and the carcasses are at

least moderately symmetrical and uniform in contour. The minimum degree of marbling required increases with advancing maturity throughout this group from a typical slight amount to a maximum small amount (see Figure 1) and the ribeye muscle is slightly soft.

A development of quality superior to that specified as minimum for the Good grade may compensate, without limit, for a development of conformation inferior to that specified as minimum for Good at an equal rate as indicated in the following example: A carcass which has mid-point Good grade quality may have conformation equivalent to the mid-point of the Standard grade and remain eligible for Good. Also, a carcass which has at least one-third of a grade superior conformation to that specified as minimum for the grade may qualify for Good with a development of quality equivalent to the lower limit of the upper third of the Standard grade. Compensation of superior conformation for inferior quality is limited to one-third of a quality grade.

STANDARD

Carcasses and wholesale cuts with minimum Standard grade conformation tend to be thinly muscled throughout and are slightly narrow and thin in relation to their length. Loins and ribs tend to be flat and slightly thin fleshed. The rounds tend to be thin and slightly concave. Chucks tend to be flat and thin fleshed.

Minimum quality characteristics are described for two maturity groups which cover the entire range of maturity permitted in the Standard grade.

Carcasses in the younger group range from the youngest that are eligible for the beef class to those at the juncture of the two maturity groups, which have slightly red and slightly soft chine bones and cartilages on the ends of the thoracic vertebrae that have some evidence of ossification. In addition, the sacral vertebrae are completely fused and the cartilages on the ends of the lumbar vertebrae are nearly completely ossified. The rib bones are slightly wide and slightly flat and the ribeye muscle is slightly dark red in color and is fine in texture. The minimum degree of marbling required increases with advancing maturity throughout this group from minimum practically devoid to maximum practically devoid (see Figure 1) and the ribeye muscle is soft.

Carcasses in the older group range from those described above as representative of the juncture of the two groups to those at the maximum maturity permitted in the Standard grade, which have chine bones tinged with red and cartilages on the ends of the thoracic vertebrae that are moderately ossified. In addition, the cut surface of the lean is moderately fine in texture and the carcasses are at least moderately symmetrical and uniform in contour. The minimum degree of marbling required increases with advancing maturity throughout this group from minimum traces to a typical slight amount (see Figure 1) and the ribeye muscle is moderately soft.

A development of quality superior to that specified as minimum for the Standard grade may compensate, without limit, for a development of conformation inferior to that specified as minimum for Standard at an equal rate as indicated in the following example: A carcass which has mid-point Standard quality may have conformation equal to the mid-point of the Utility grade and remain

eligible for Standard. Also, a carcass which has at least one-third of a grade superior conformation to that specified as minimum for the grade may qualify for Standard with a development of quality equal to the minimum of the upper third of the Utility grade. Compensation of superior conformation for inferior quality is limited to one-third of a quality grade.

COMMERCIAL

Commercial grade beef carcasses and wholesale cuts are restricted to those with evidences of more advanced maturity than permitted in the Good and Standard grades. Carcasses and wholesale cuts with minimum Commercial grade conformation are slightly thin muscled throughout. However, because of the usually moderately heavy fat covering the carcasses tend to be slightly thick but rather rough and irregular in contour. Rounds tend to be thin and slightly concave. Loins tend to be moderately wide but slightly sunken and the hips are rather prominent. Ribs tend to be slightly thick and full. Chucks are slightly thin and the plates and briskets are wide and "spready." The necks and shanks are slightly long and thin.

Three maturity groups are recognized in the Commercial grade. Minimum quality characteristics are described for the youngest and the most mature of these groups. The requirements for the intermediate group are determined by interpolation between the requirements indicated for the two groups described.

Carcasses in the youngest group permitted in the Commercial grade range from those with indications of maturity barely more advanced than described as maximum for the Good and Standard grades to those with moderately hard, rather white chine bones and with cartilages on the ends of the thoracic vertebrae that show considerable ossification but the outlines of the cartilages are still plainly visible. In addition, the rib bones are moderately wide and flat and the ribeye muscle is moderately dark red and slightly coarse in texture. The minimum degree of marbling required increases with advancing maturity throughout this group from a minimum small amount to a maximum small amount (see Figure 1) and the ribeye muscle is slightly firm.

The youngest carcasses in the most mature group included in the Commercial grade have hard, white chine bones and the outlines of the cartilages on the ends of the thoracic vertebrae are barely visible, the rib bones are wide and flat, and the ribeye muscle is dark red and coarse in texture. The range in maturity in this group extends to include carcasses from the oldest animals marketed. The minimum degree of marbling required increases with advancing maturity throughout this group from a minimum moderate amount to a maximum moderate amount (see Figure 1) and the ribeye muscle is firm.

A development of quality superior to that specified as minimum for the Commercial grade may compensate, without limit, for a development of conformation inferior to that specified as minimum for Commercial at an equal rate as indicated in the following example: A carcass which has mid-point Commercial quality may have conformation equal to the mid-point of the Utility grade and remain eligible for Commercial. However, regardless of the extent to which the conformation of a carcass exceeds the minimum of the

Commercial grade, the carcass must have quality to the minimum of the Commercial grade to be eligible for Commercial.

UTILITY

Carcasses and wholesale cuts with minimum Utility grade conformation are thinly muscled throughout and are very narrow in relation to their length. They are decidedly rangy, angular, and irregular in contour, and are usually thinly fleshed. The loins and ribs are flat and thinly fleshed. The rounds tend to be very thin and concave. The chucks are thin and flat. The necks and shanks are long and tapering. The hips and shoulder joints are prominent.

Carcasses within the full range of maturity classified as beef are included in the Utility grade. Thus, five maturity groups are recognized. Minimum quality requirements are described for three of these groups--the first or youngest, the third or intermediate, and the fifth or the most mature. The requirements for the second and fourth maturity groups are determined by interpolation between the requirements described for their adjoining groups.

Carcasses in the first or youngest maturity group range from the youngest that are eligible for the beef class to those at the juncture of the first two maturity groups, which have slightly red and slightly soft chine bones and cartilages on the ends of the thoracic vertebrae that have some evidence of ossification. In addition, the sacral vertebrae are completely fused and the cartilages on the ends of the lumbar vertebrae are nearly completely ossified. The rib bones are slightly flat and the ribeye muscle is slightly dark red in color and fine in texture. In carcasses throughout the range of maturity included in this group, the ribeye muscle is devoid of marbling and is soft and slightly watery.

Carcasses in the third or intermediate maturity group range from those with indications of maturity barely more advanced than described as maximum for the Good and Standard grades to those with moderately hard, rather white chine bones and with cartilages on the ends of the thoracic vertebrae that show considerable ossification but the outlines of the cartilages are still plainly visible. In addition, the rib bones are moderately wide and flat and the ribeye muscle is dark red in color and slightly coarse in texture. The minimum degree of marbling required increases with advancing maturity throughout this group from a minimum practically devoid to a maximum practically devoid (see Figure 1) and the ribeye muscle is moderately soft.

The youngest carcasses in the fifth or oldest maturity group have hard, white chine bones and the outlines of the cartilages on the ends of the thoracic vertebrae are barely visible, the rib bones are wide and flat and the ribeye muscle is very dark red and coarse in texture. The range in maturity in this group extends to include carcasses from the oldest animals produced. The minimum degree of marbling required increases with advancing maturity throughout this group from a minimum slight amount to a maximum slight amount (see Figure 1) and the ribeye muscle is slightly firm.

A development of quality which is superior to that specified as minimum for the Utility grade may compensate, without limit, for a development of conformation inferior to that specified as minimum for Utility at an equal rate as indicated in the following example: A carcass which has mid-point Utility quality may have conformation equal to the mid-point of the Cutter grade and remain

eligible for Utility. Also, a carcass which has at least one-third of a grade superior conformation to that specified for the minimum of the grade may qualify for Utility with a development of quality equal to the lower limit of the upper third of the Cutter grade. Compensation of superior conformation for inferior quality is limited to one-third of a quality grade.

CUTTER

Carcasses and wholesale cuts with minimum Cutter grade conformation are very thinly muscled throughout. They are rangy, angular, and irregular in contour, and very thinly fleshed. The loins and ribs are very flat, thin, and shallow. The rounds are very thin and very concave. The chucks are very flat, thin, and shallow. The necks and shanks are very long and tapering. The hips and shoulder joints are very prominent.

Carcasses within the full range of maturity classified as beef are included in the Cutter grade. Thus, five maturity groups are recognized. Minimum quality requirements are described for three of these groups--the first or youngest, the third or intermediate, and the fifth or the most mature. The requirements for the second and fourth maturity groups are determined by interpolation between the requirements described for their adjoining groups.

Carcasses in the first or youngest maturity group range from the youngest that are eligible for the beef class to those at the juncture of the first two maturity groups, which have slightly red and slightly soft chine bones and cartilages on the ends of the thoracic vertebrae that have some evidence of ossification. In addition, the sacral vertebrae are completely fused and the cartilages on the ends of the lumbar vertebrae are nearly completely ossified. The rib bones are slightly wide and slightly flat and the ribeye muscle is slightly dark red in color and fine in texture. In carcasses throughout the range of maturity included in this group, the ribeye muscle is devoid of marbling and is very soft and watery.

Carcasses in the third or intermediate maturity group range from those with indications of maturity barely more advanced than described as maximum for the Good and Standard grades to those with moderately hard, rather white chine bones and with cartilages on the ends of the thoracic vertebrae that show considerable ossification but the outlines of the cartilages are still plainly visible. In addition, the rib bones are moderately wide and flat and the ribeye muscle is dark red in color and slightly coarse in texture. In carcasses throughout the range of maturity included in this group, the ribeye muscle is devoid of marbling and is soft and watery.

Carcasses in the fifth or oldest maturity group have hard white chine bones and the outlines of the cartilages on the ends of the thoracic vertebrae are barely visible, the rib bones are wide and flat, and the ribeye muscle is very dark red in color and coarse in texture. The range in maturity in this group extends to include carcasses from the oldest animals produced. The minimum degree of marbling required increases with advancing maturity throughout this group from minimum practically devoid to maximum practically devoid (see Figure 1) and the ribeye muscle is soft and slightly watery.

A development of quality which is superior to that specified as minimum for the Cutter grade may compensate, without limit, for

a development of conformation inferior to that specified as minimum for Cutter at an equal rate as indicated in the following example: A carcass which has mid-point Cutter quality may have conformation equal to the mid-point of the Canner grade and remain eligible for Cutter. Also, a carcass which has at least one-third of a grade superior conformation to that specified for the minimum of the grade may qualify for Cutter with a development of quality equal to the lower limit of the upper third of the Canner grade. Compensation of superior conformation for inferior quality is limited to one-third of a quality grade.

CANNER

The Canner grade includes only those carcasses that are inferior to the minimum requirements specified for the Cutter grade.

SPECIFICATIONS FOR OFFICIAL UNITED STATES STANDARDS FOR GRADES OF CARCASS BEEF (QUALITY--BULL)

CHOICE

Choice grade bull beef carcasses have excellent quality, finish, and conformation for the class. Rounds, chucks, and neck are thick and are very heavily muscled. Loins and ribs are broad but tend to shallowness and are relatively small in proportion to the rest of the carcass. The exterior surface is well covered with fat which, although rough, is not gobby or excessively deep at any point. Interior fats are plentiful but are somewhat lacking in firmness and brittleness. Usually such carcasses are derived from young, well-fed bulls, although sometimes carcasses of older bulls meet the requirements of this grade. The flesh generally is of a medium dark red color, firm but comparatively dry.

GOOD

Good grade bull beef carcasses have good quality, finish, and conformation for the class. Rounds, chucks, and neck are thick and heavily muscled. Loins and ribs are relatively small in proportion to the rest of the carcass and are somewhat flat. The general outline is somewhat rough and irregular. Except for the shanks, neck, lower rounds, and shoulders, exterior surfaces generally are covered with a rough but relatively thin layer of fat. Interior fats are in moderate supply. All fats are somewhat soft and may be slightly oily. Flesh generally is medium dark red in color, moderately firm, and dry.

COMMERCIAL

Commercial grade bull beef carcasses possess average quality, finish, and conformation for the class. Rounds, chucks, and neck are thick and full. Loins are relatively thin and flat or sunken. Ribs are moderately thin. Exterior fats are scant and unevenly distributed and generally appear only in spots over the back and rump. Interior fats are likewise scant, with small quantities in the crotch and around the kidneys. The flesh is moderately firm, but usually very dry. Its color varies from dark red to light brown.

UTILITY

Utility grade bull beef carcasses, although fairly well-developed in the rounds and chucks, are deficient in these respects as compared with the higher grades. Such a carcass generally is rough in conformation. Loins are very thin or sunken and ribs are flat and thin. Exterior fats generally are lacking, although small quantities may be found on the back and rump. As a rule, interior fats are absent, although slight traces may be found around the kidneys. The flesh is dry and very dark.

CUTTER

Cutter grade bull beef carcasses have poor quality and conformation with practically no visible finish. The general outlines are very uneven. Loins and ribs are very flat and thin. Hip and shoulder bones and ribs are very prominent. Generally there are no exterior or interior fats. Flesh, though relatively dry is inclined to be soft. Its color is dark red to light brown.

CANNER

Canner grade bull beef carcasses have extremely poor quality and conformation. Visible finish is generally absent. A carcass of this grade is extremely thin in all parts. Rounds and chucks are thin; loins and ribs are very thin and flat or sunken. There are no exterior or interior fats. Flesh is soft and dark.

SPECIFICATIONS FOR OFFICIAL UNITED STATES STANDARDS FOR GRADES OF CARCASS BEEF (QUALITY--STAG)

CHOICE

Choice grade stag beef carcasses have excellent quality, finish, and conformation for the class. Rounds are thick, full, and bulging. Loins and ribs are moderately thick, and chucks are thick and heavily fleshed. Necks are moderately short and thick. The exterior fat covering of the carcass, although slightly rough, generally extends well over the carcass. Interior fats are plentiful in the crotch and on the breast, and the kidneys, as a rule, are well-covered. Flesh is firm and fine-grained for the class and shows some intermixture of fat along the muscle seams. Its color varies from medium to dark red.

GOOD

Good grade stag beef carcasses have good quality, finish, and conformation for the class. Rounds are moderately thick and full; loins and ribs are fairly well-proportioned and have moderate depth of flesh. Chucks are thick and necks are moderately thick and short. Except on shanks, neck, lower rounds, and shoulders, a carcass of this grade is fairly well-covered with a thin layer of fat. Interior fats generally are in moderate supply but may be slightly deficient. The flesh is firm, moderately fine-grained, and varies from medium to dark red in color.

COMMERCIAL

Commercial grade stag beef carcasses have fair quality, finish, and conformation. Rounds, although somewhat full and thick, are inclined to be tapering. Loins are flat and ribs are somewhat thin. Chucks are broad and relatively thin. Exterior fats are unevenly distributed and generally appear as a thin layer over the back and in thin patches on the rump and shoulders. Interior fats are somewhat scant and kidneys are generally only partially covered. The flesh is usually slightly soft and moist. Its color varies from medium to dark red.

UTILITY

Utility grade stag beef carcasses have poor quality, finish, and conformation. Rounds are thin and tapering. Loins are thin, flat, or slightly sunken. Ribs are thin and chucks are broad and thin. Both exterior and interior fats are scant. Thin patches of fat are usually found along the back and on the shoulders. Small quantities usually are found in the crotch and around the kidneys. Flesh is soft, moist, and dark-colored.

CUTTER

Cutter grade stag beef carcasses are decidedly deficient in quality, finish, and conformation. Rounds are thin, long, and tapering. Loins are very flat or sunken, and ribs are flat and very thin. Chucks and plates are broad and thin. All bones are prominent because of deficient flesh and fat covering. Except for very small patches along the back and around the kidneys, visible fats are absent. The flesh is soft, watery, and dark-colored. This grade is seldom found on the markets.

CANNER

Canner grade stag beef carcasses are extremely deficient in quality, finish, and conformation. All bones are very prominent. Rounds are extremely thin and sharply tapering. Loins are also extremely thin and dished or sunken. Ribs, chucks, and plates are very thin. No visible exterior or interior fats are present. The flesh is dark, soft, and watery. This grade is rarely found on the markets.

